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AUTHOR Dorfman, Peter W.; Stephan, Walter G.
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ABSTRACT

Literature from organizational and social psychology has suggested that three types of factors influence performance, i.e., cognitive, affective and behavioral. A model was developed to test a set of propositions concerning the relationship between the three kinds of factors, and included attributions, expectancies, general emotional responses to prior performances, task satisfaction, prior task performance, subsequent effort, and final performance. Data were collected from business students (N=93) participating in a business decision-making game. Path analysis results provided considerable support for the model, including that: (1) attributions for outcome at midpoint of the game were influenced by quality of the outcome; (2) higher expectations were associated with internal attributions; and (3) affective responses were a function of prior performance, internal attributions, and high expectancies. The findings demonstrate the interplay of a variety of causal factors that contribute to performance outcome. (Author/JAC)

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Cognitive, Affective, and Behavioral Determinants of Performance: A Process Model

Peter W. Dorfman
Management Department

Walter G. Stephan
Psychology Department

New Mexico State University

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Running Head: Determinants of Performance: A Process Model
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Cognitive, Affective, and Behavioral Determinants of Performance: A Process Model

The determinants of job and task performance have been a major topic of investigation among organizational and social psychologists for decades. The literature from both disciplines suggests that three types of factors influence performance: cognitive, affective, and behavioral. Cognitive processes, such as those posited by expectancy theories of motivation, comprise a large proportion of the recent organizational research (Mitchell, 1979). A set of cognitive processes originally developed by social psychologists has also received considerable attention by industrial/organizational psychologists--the attributions that have been made for previous performance (Green & Mitchell, 1979; Mitchell, 1979; Staw, 1975). A set of affective factors that influence performance, particularly general arousal and emotional states, have also been a topic of empirical study by psychologists for many years (Malmo, 1959; Taylor, 1956). Organizational psychologists have concentrated on affective responses related to specific organizational rewards (e.g., pay, promotions) and overall job satisfaction (Landy, 1978; Locke, 1976). Only recently has a broader role of affect in response to performance been explored in organizational theories (e.g., Naylor, Pritchard, and Ilgen, 1980). In addition to cognitive and affective states, it is clear that there are also important behavioral antecedents to effective performance. The amount of effort (time and intensity) an individual puts into a task is often critical to task success. Finally, an individual's ability clearly affects performance.

Two broad theoretical frameworks have been employed to explain the relationships of these three general types of factors to performance--the industrial/organizational approach and the social psychological approach.

From both perspectives, similar antecedent causes (e.g., effort, ability) are thought to affect subsequent performance level. Also, both approaches have suggested similar mediating variables (i.e., attributions, emotional responses). We have attempted to integrate concepts from both approaches in the present study. Our integration of these approaches yields a single causal model. The classes of variables in the model include cognitive factors--attributions and expectancies, affective factors-task satisfaction and general affective responses, and behavioral factors--prior task performance and subsequent effort. While some of the specific causal relationships in our model have been previously investigated using simple correlation and ANOVA techniques, others have not received even cursory investigation. Our goal is to test a specific set of propositions concerning the interrelationships among the cognitive, affective, and behavioral determinants of performance. A secondary goal is to compare the relative strength of these determinants within a given context. Five specific causal propositions will be presented and tested.

Propositions

Proposition one specifies the influence of prior performance on subsequent attributions (cf., Snyder, Stephan & Rosenfield, 1978). For some time, social psychologists have been interested in the attributions people make for achievement outcomes (e.g., Weiner, Frieze, Kukla, Reed, Rest & Rosenbaum, 1971). Likewise, organizational psychologists--particularly within the leadership area, have also found an attributional approach to be fruitful. One common finding in both literatures is that people tend to attribute positive outcomes to internal factors such as their skill or effort on the task, whereas they tend to attribute negative outcomes to external factors such as the difficulty of the task or bad luck. This

typical pattern of attributions for achievement has been labeled egotism (Snyder, et al., 1978), because these attributions serve ego enhancing and ego defensive functions.

Proposition 1. Successful performance will lead to internal attributions (ability and effort) and unsuccessful performance will lead to external attributions (task difficulty and luck).

The second proposition examines the causal impact of attributions on expectancies. Expectancy theories of work motivation continue to dominate the organizational literature (Campbell & Pritchard, 1976; Miner, 1980; Mitchell, 1979). These cognitive theories posit that employee motivation is a function of conscious, rational thought processes. Although there is little agreement as to the best expectancy theory, most have the following core constructs: measures of expectancy and/or instrumentality, the valence of organizational outcomes, effort, satisfaction, and performance. A typical prediction based on this approach is that individuals will work harder and longer when they perceive that hard work will lead to desirable organizational rewards. The literature provides overall support for expectancy models (Mitchell, 1979). In the present study, we will be investigating the antecedents of expectancy variables as well as their effects on effort and performance.

Recently, Campbell and Pritchard (1976) suggested that the attributions individuals make for their prior performances may be a critical factor influencing the development of expectancies. For instance, expectancies that effort will lead to success should only be high when a person believes that his/her effort and/or ability has contributed to his/her prior performances. Correspondingly, when poor performance is attributed to external factors, expectancies are likely to be low.

Proposition 2. Attributions will have an impact on expectancies, with internal attributions being associated with high expectancies.

Proposition three specifies three causal antecedents of general emotional responses and task satisfaction--(a) prior performance, (b) attributions for this performance, and (c) expectancies. The organizational literature provides evidence that job satisfaction will often result from high performance (Porter & Lawler, 1968). Consistent with this, social psychological research has also found that positive emotional reactions result from high performance outcomes (Stephan & Gollwitzer, 1981; Weiner, Russell & Lerman, 1979). In developing the model we designed a measure of affect that combines a generalized level of affect associated with feelings of pleasure, happiness and well being with a construct of affect usually conceptualized as job or task satisfaction. The present conceptualization of affect--a combined measure--is similar to the construct of affect as developed by Naylor, et al. (1980). We are predicting that the composite measure of general emotional responses and task satisfaction will be influenced by prior performance.

Since there is wide agreement that job satisfaction is an affective state that results from the appraisal of one's job or job experiences (Landy, 1978; Locke, 1976), it seems reasonable to predict that a person's satisfaction with his/her performance would be influenced by his/her attributions. The social psychological literature helps to specify the nature of this relationship. The results of several studies indicate that internal attributions lead to more intense emotional reactions to achievement outcomes than do external attributions (Bradley, 1978; Sohn, 1977; Stephan, Stephan & Dorfman, 1981). Thus, after succeeding on an achievement task people who make internal attributions for their successes tend to feel more

positively than those who make external attributions. Correspondingly, people who attribute their failures to internal factors feel worse than those who attribute failure to external factors. Therefore it seems likely that emotional reactions are caused in part by achievement attributions.

In addition to being influenced by prior performance and attributions, a person's affect may be partially determined by expectancies. The reasoning behind this prediction is that individuals should feel more positively if they believe that their effort can lead to high performance and valued outcomes (high effort-reward expectancies). Correspondingly, if individuals have low effort-reward expectancies, this feeling of "lack of control" can lead to negative emotions (cf. Abramson, Seligman & Teasdale, 1978). Therefore, we predict that the expectancy variable will be a causal antecedent of affect.

Proposition 3. Affect (including general emotional reactions and task satisfaction) is influenced by (a) performance, (b) attributions, and (c) expectancies.

Proposition four examines the relationship between the previously discussed cognitive and affective responses and subsequent effort, a behavioral factor. Although performance is usually considered to be the ultimate criterion in organizational research, it is not the dependent variable which most expectancy models have attempted to explain, primarily because antecedent variables other than motivation contribute to task performance. Instead, the primary dependent variable in expectancy research has been the amount of effort an individual expends on a task (Campbell & Pritchard, 1976; Peters, 1977). In our model it is predicted that high expectancies (effort-reward probabilities) will lead to high levels of effort; conversely, low expectancies should lead to a lesser level of

effort. We should note that the organizational literature generally supports the effort-expectancy prediction, particularly with methodological refinements characteristic of recent studies (Kopelman, 1977; Mitchell, 1979).

In our model we are also predicting that effort will be influenced by affect. Although the relationship between task satisfaction and performance is complex (Naylor, et al, 1980), it is reasonable to predict that if satisfaction is derived from performing well on a task, an individual will continue to strive to do well in the future (Locke, 1976). As noted previously, our model predicts that a person's affect will be influenced by his/her performance. The prediction that future effort will be influenced by past affect assumes that the individual continues to desire the rewards and satisfaction provided by performing at a high level.

A third antecedent factor that may influence effort is attributions for prior performances. To the extent that internal attributions are made for prior performances, people would be expected to exert more effort on future tasks. For instance, if poor performances are attributed to a lack of effort one remedy is to put forth more effort in the future.

Proposition 4. Increased effort should be the result of (a) positive affect, (b) internal attributions, and (c) high expectancies.

The last proposition (5) examines the relationships among final performance and the previously discussed behavioral, affective and cognitive variables. Specifically, three of these variables will be considered, prior performance, affect, and effort. All three of these predictions are relatively straightforward.

We are predicting that initial level of performance will influence final performance. We expect that prior performance will be a predictor

of later performance to the extent that important task, organizational, and personal factors remain relatively stable. Because an individual's ability is relatively constant over a short time span, prior performance on a task would be expected to be highly correlated with subsequent performance.

The model includes an affect-performance link for several reasons. An individual's affect may be caused by, as well as a cause of, performance (Locke, 1976; Organ, 1977). The task used in this study requires close cooperation between group members. Negative or positive feelings towards the task and other group members are likely to have an influence on working relationships that will eventually impact on performance. Furthermore, it seems reasonable to predict that the quality of peoples' performances is influenced by their affective state--people are likely to make bad decisions when angry, frustrated, and unhappy.

The third and final predictor of performance, effort, reflects one of the basic tenets of industrial/organizational psychology. That is, performance is viewed as being a function of ability and motivation (Campbell & Pritchard, 1976). Although this is certainly an oversimplification, because many other factors influence performance (e.g., role conflict, organizational constraints, etc.), an individual with both the ability and motivation should perform at a high level. A motivated and commited individual is likely to devote considerable effort to an activity. This effort should in turn lead to high performance.

Proposition 5. Final performance will be impacted directly by (a) the initial level of performance, (b) affective reactions to this performance, and (c) by the level of effort expended.

Performance Model and Data Analysis Techniques

The posited causal relationships between the behavioral, affective, and cognitive variables are presented as a path model in Figure 1. Path

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Insert Figure 1 about here

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analysis is a technique that employs regression analyses to test the suitability of a given model for understanding the relationships among a set of variables (Kerlinger & Pedhazur, 1973). An advantage of path analysis is that the underlying processes by which all of the antecedent variables influence performance can be specified. The technique also allows the decomposition of the processes into direct and indirect effects of variables on one another. Based on the previous discussion and propositions, the predicted model deletes certain linkages found in a fully identified model (i.e., all allowable recursive paths are present in a fully identified model). In our model the omission of a linkage is a theoretical assertion that some intervening mechanism must occur in order for it to eventually influence performance. Notice, for example, that attributions are predicted to influence performance only indirectly, through their impact on affect and effort.

The predicted model was tested using path analysis. A theory trimming technique (Heise, 1969) was then employed to delete non-significant paths from the model. This created a new slimmed down model. Path coefficients were subsequently calculated for this trimmed model and tested for significance. The trimmed model was then examined to determine if the data were consistent with the theoretical formulation. Two procedures that have been developed for model testing were used. The first technique employed

the newly developed path coefficients to recreate the original correlation matrix (R). The recreated correlations were examined for their similarity to the original or "true" correlation matrix. A second procedure was used to determine if the trimmed model accounted for as much of the variance as the original model. A large sample chi-square test was used to check for significant changes in the amount of variance accounted for (Nie, Hull, Jenkins, Steinbrenner, & Bent, 1975).

Method

Sample and Task

The subjects in this study were business students (N = 93) at New Mexico State University who were enrolled in one of five sections of a business policy class. A major portion of their grades in this class was earned by participating in a management game designed to simulate business decision making. The game required that the students work together in small groups (N = 3 or 4) and make a variety of weekly decisions that affected their company's profits. Specifically, students made 18 operating decisions (e.g., price of finished goods) and three lag decisions (e.g., plant production capacity) for each quarter year of operations. The game ran for "three years" and therefore required each team to make 12 sets of decisions. The computer simulated the effects of each decision and produced a printout showing results for each team during the previous quarter.

The game was designed to closely approximate reality. In order to do well, students had to (a) draw on "key" operating equations (e.g., finished goods market share) to make quality operating decisions (e.g., price of finished goods), (b) decide on the relative benefit/cost of complying with various social responsibility considerations (e.g., pay for pollution

controls or risk a costly EPA suit). Just as in the real world, there were elements of chance and uncertainty involved in the outcomes of the game. For instance, the students did not know whether their company would be inspected by the Environmental Protection Agency and fined for non-compliance. However, it was also clear that pricing goods too low in order to get a larger market share would result in a loss for the company. At the end of each "quarter," students received information concerning how well their company had performed. Although a variety of indicators of performance was available (net profit, retained earnings, finished goods, market share, and total assets, among others) most of these were highly correlated. Net profit earned by the company was the basic performance measure in this study because it was considered to be the most important and representative measure by both faculty and students.

Measures

Each student completed a questionnaire after the midpoint in the simulation game (completion of six sets of decisions with corresponding feedback). The questionnaire asked the students to provide effort/reward expectancy information and valence (of outcomes) information. The expectancy measure was operationalized for two levels of effort (maximum and minimum) and consisted of six questions. The first was "If you were to work especially hard, what would your chances be of getting an excellent grade in the simulation game." The other questions were about the chances of obtaining useful knowledge and enjoying the game. The second set of three items asked about their perception of the chances of receiving an excellent grade, obtaining useful knowledge and enjoying the game if they put in only minimal effort. The response format for all six questions was comprised of nine-point scales running from "poor" to "excellent." The

valence of outcomes was assessed by three questions that reflected the importance of the grade, obtaining useful knowledge and enjoying the game. Again, a nine-point response format was used. In this case, the anchors were "not important" and "very important."

The questionnaire also included four attribution items and 17 emotional response items. The four attribution items requested that the students indicate the degree to which each of four factors had contributed to their performance at the halfway point of the game. The four questions concerned the contributions of the internal factors of ability and effort, and the external factors of task difficulty and luck (Weiner, et. al., 1971). The response format ran from "hindered our team greatly" (-4) to "helped our team greatly" (+4), (Stephan, Rosenfield, & Stephan, 1976). The emotional response items requested that students indicate how their results made them feel on the following dimensions: confident, happy, hopeful, ashamed, regretful, proud, competent, guilty, anxious, and helpless. These items were set up in a nine-point semantic differential format. Seven items were used to assess satisfaction. They referred to enjoyment in working together, playing the game, using and computing the equations, whether they had thought of giving up, their satisfaction with their forecasting decisions, whether they were satisfied with their group, and whether the rewards were worth the effort. A nine-point Likert scale was used for the responses. The performance of the "companies" was recorded at the midpoint in the game and again at the end of the game. After the game was completed, task effort was assessed by asking each student how much time on the average he/she had put into each of the weekly decisions.

Results

Path analysis was used on the predicted model to analyze the determinants of final performance on the game. The following variables were entered into the path analysis in the sequence specified by the predicted model: performance at the midpoint in the game, attributions for this performance, affect (a composite of general emotional responses and task satisfaction), the effort/reward expectancy and the valence of these outcomes, actual effort on the task, and final performance on the task. Performance at the midpoint was simply the net profits resulting from the preceding decisions on the game. An attribution index was calculated by adding the absolute value of each subject's attributions to ability and effort and subtracting the absolute values of the attributions to task difficulty and luck. This index reflects the degree to which internal factors were emphasized to a greater degree than external factors in accounting for the subjects' outcomes (Stevens & Jones, 1977). The affect measure was also a composite index. It was comprised of the z scores of the general emotional items combined with the z scores of the more specific emotional responses associated with task satisfaction. The expectancy measure was developed in a manner similar to that employed by Kopelman (1978). The expectancy index was created by multiplying the three valence items by the corresponding expectancy items referring to the effects of maximal effort and summing them (ΣVEmax). In a similar manner, the three valence items were multiplied by the expectancy items referring to minimal effort and summed (ΣVEmin). The latter index (ΣVEmin) was subtracted from the former (ΣVEmax) to obtain an index reflecting an expectancy for return on effort (ROE). The return on effort measure was intended to capture the

cognitive strategy many students use in deciding what level of effort to put forth in order to obtain a specific grade.

The bivariate correlations among the items are shown in Table 1. The

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Insert Table 1 about here

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reliabilities for the multiple item measures of affect and expectancies were .90 and .82 respectively (KR 14). Since the attribution measure is comprised of two distinct indices (internality and externality) each of which has only two items, an internal consistency estimate of reliability is of little value and therefore was not computed.

The significant path coefficients are presented in Figure 2. There were eleven paths in the predicted model. The results indicate that nine

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Insert Figure 2 about here

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paths were statistically significant ($p < .05$). The "trimmed" or reduced model was obtained by setting the nonsignificant paths equal to zero and renalyzing the data (Heise, 1975). The path analysis thus provided substantial support for the majority of the propositions. Taken together these variables accounted for a very respectable 35% of the variance in final performance ($R = .59$). Furthermore, the original correlation matrix was closely reproduced using the new path coefficients in the trimmed model. The amount of variance accounted for in the trimmed model (35%.) was not significantly different from that of the predicted model (36%.).

As predicted in proposition 1, successful performance led to more internal attributions than external attributions. The path coefficient

from performance to attributions was .20 ($p < .05$). The second proposition examined the relationship between attributions and expectancies. The path coefficient from attribution to expectancy was .40 ($p < .01$). Note that the correlation between initial performance and expectancies was essentially zero ($r = .04$). The absence of a path from the performance at midpoint to the expectancies in the predicted model was an assertion that there would be no direct impact of prior performance on expectancies; only when attributions for performance are considered does successful or unsuccessful performances affect the expectancies. Proposition three was also supported. Emotional reactions were influenced by performance at the midpoint (path coefficient (p.c.) = .33, $p < .01$), by the attributions for that performance (p.c. = .30, $p < .01$) and by expectancies (p.c. = .21, $p < .05$).

The fourth proposition regarding the causal antecedents of effort was only partially supported. As predicted, effort was influenced by the affect composite (p.c. = .25, $p < .02$). However, the anticipated link from attributions to effort and expectancy to effort was nonsignificant (p.c. = .01, and .14, $p > .05$ ns). Possible reasons for this will be presented in the discussion.

Finally, proposition 5 was supported by the analysis. The effects of performance at the midpont (p.c. = .39, $p < .01$), the actual effort in the game (p.c. = .23, $p < .01$) and affect (p.c. = .21, $p < .05$) were all significant as direct effects on final performance. Also as expected, final performance had numerous indirect causal factors. One indirect effect on final performance was the effect of prior performance as mediated by affective reactions. Prior performance also had an impact on final performance through its impact on attributions. Attributions, in turn, influenced performance indirectly through expectancies and affect. Expectancies,

like attributions, had an indirect effect through affect. Finally, affective reactions which had a direct impact on final performance also had an indirect impact through effort. Thus, performance at midpoint, attributions, expectancies and affective responses all had indirect causal effects on final performance.

Several of these indirect paths seem noteworthy, although they were not stated directly in propositional form. First, attributions did not have a direct effect on performance, but only an indirect effect through affect. Second, expectancies only had indirect effects on future performance--an effect mediated by emotional responses and a weak effect through effort (p.c. between expectancy and effort = .14 n.s.).

Discussion

The results of the path analysis provide considerable support for the predicted causal model outlined in Figure 1. The actual (i.e., trimmed) model is presented in Figure 2. Taken together, these results yield a complex picture of the determinants of performance that includes cognitive, affective, and behavioral factors.

As predicted in proposition 1, there was a significant relationship between oucomes at the midpoint in the game and the degree to which internal factors were used to explain these outcomes. Thus, in this study, as in so many others, positive outcomes tended to be attributed to internal factors and negative outcomes tended to be attributed to external factors (see Bradley, 1978; Snyder, et al., 1978 for reviews). These attributions in turn, affected the expectation that effort would lead to valued outcomes (proposition 2) and the students' satisfaction and emotional responses to their prior outcomes (proposition 3).

One unique contribution of our study is that expectancies were found to be a function of attributions. When performance outcomes are attributed to external factors there is little reason for a person to expect that effort will lead to valued outcomes. While this is true for both positive and negative outcomes it is of much greater practical significance for negative ones. If failure on the job is attributed to the difficulty of the job, company policies, unfairness of the supervisor, or unfavorable working conditions, the people who fail are unlikely to believe that their efforts will result in any change for the better. The consequence will be a reduction in motivation since people will not expect to obtain valued outcomes by putting forth greater effort. We can speculate that the psychological processes involved in the attribution-expectancy relationship is similar to the previously found relationship between locus of control and expectancies (Lied & Pritchard, 1976; Sims, Szilagyi, & McKemey, 1976). Feelings of lack of control over task performance, whether they originate from a relatively stable personality factor or from attributions made after performance, are likely to decrease expectancies.

Previous research and theory on expectancies also suggests that expectancies do not influence subsequent performance directly, but rather they affect subsequent effort and this influences performance (Peters, 1977; Mitchell, 1974). The results of the present study are consistent with the previous studies in finding that there was no direct relationship between expectancies and performance, but they are discrepant from previous findings in that the relationship between expectancies and effort failed to reach significance (proposition 4). It is possible that the weakness of the link between expectancies and effort was due to the fact that the students in this study accurately perceived that their own effort was only

one variable that influenced their outcomes on the game. Because the students were working as a team and competing against other teams, the quality of their teammates' efforts and the success of the other teams played a major role in their own outcomes. As one frustrated student noted, she tried hard but the lack of effort by others in her group led her to believe that her effort was nullified. In situations that are more individualistically oriented than the one in the present study, it would be anticipated that expectancies would have a greater influence on effort and thus on subsequent performance.

When the bivariate relationship between expectancies and effort is examined (see Table 1) it can be seen that it is significant ($r = .21$, $p < .05$). This indicates that in this study the relationship between expectancies and effort is being mediated by some other variable in the model. An inspection of Figure 2 reveals that expectancies did have an indirect effect on effort, an effect that was mediated by affect (propositions 3 and 4). The mediational role of affective responses is another unique contribution of this study. It suggests that people whose high expectancies are accompanied by positive affect are the most likely to work hard in order to achieve favorable outcomes. Individuals who feel good because they perform well, and who perceive that they have some responsibility for their performances are likely to work hard in the future.

One of the three predictions in proposition 4 was that attributions would have an influence on effort. This prediction was not supported by the data. As with the expectancy factor, attributions only had an indirect influence on performance, an influence that was mediated by affect.

The links between attributions and affect and prior performance and affect had been predicted on the basis of previous research indicating

that high performances lead to positive affect (Porter & Lawler, 1968; Locke, 1970) and that attributing high prior performances to internal factors leads to positive affect (Stephan, et al., 1981; Weiner, et al., 1978). The former effect was probably due to conditioning; people tend to be rewarded for success in their job and punished (reprimanded, terminated, transferred or paid poorly) when they perform poorly. Locke (1976) has argued that high productivity should cause satisfaction when it leads to the attainment of important job values (success) and rewards (recognition, high pay). Thus it's no surpise to find in the present study that performance is related to satisfaction because good performance directly led to important outcomes--a good grade and recognition from the teacher and other students. The effect of attributions on affect is potentially more important because it suggests that cognitions determine affect. Thus, if people learn to take credit for their performance in job settings, they are more likely to feel proud and confident than if they attribute their success to external factors. This attribution-affect link takes on added significance when it is considered that in this study affective responses had both an indirect and a direct effect on subsequent performance (propositions 4 and 5).

The direct effect of affect on performance was probably due to a variety of factors. Since task satisfaction was obtained from high performance (proposition 3) it would be expected that the level of effort and work activities would be repeated. Presumably, those individuals with the knowledge and ability to perform well at the midpoint continued to desire the rewards that were associated with high performance levels. These individuals continued to work hard (proposition 4) and succeed (proposition 5). It also seems probable that students who felt satisfied and

happy at the midpoint in the game worked more effectively with their teammates during the second half of the semester. In contrast, students in poorly performing groups reported that dissatisfaction and negative emotional responses caused bickering and apathy that interfered with the performance of the team.

In summary, the present study demonstrates the interplay of a variety of causal factors that contribute to performance outcomes. This causal web includes the cognitive factors of expectancies and attributions, the affective factors of satisfaction and emotional responses and the behavioral factors of prior performance and actual effort. The majority of the propositions outlined in the introduction were supported by the data. The most important findings are as follows. High performance led to ego enhancing internal attributions whereas low performances led to ego defensive external attributions (proposition 1). These attributions had an impact on expectancies, with internal attributions being associated with high expectancies (proposition 2). The expectancies, as well as the attributions and prior performance were significant predictors of satisfaction and emotional responses (proposition 3). However, while satisfaction/emotional responses were related to actual effort, neither attributions nor expectancies predicted effort (proposition 4). Instead, both attributions and expectancies influenced effort indirectly, with their role being mediated by satisfaction/emotional responses. Finally, subsequent performance was significantly influenced by prior performance, affective responses, and effort (proposition 5).

We have considered only a limited number of cognitive, behavioral, and affective factors that may be relevant to performance. The results justify the conclusion that this approach is a fruitful way of investigating the

interrelationships of these factors and understanding the causal antecedents to performance.

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Footnotes

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Requests for reprints should be sent to Peter W. Dorfman, Department of Management, Box 3DJ, New Mexico State University, Las Cruces, New Mexico 88003.

Table 1

Intercorrelations Among Performance Variables, Cognitive, Affective, and Behavioral Items

	1	2	3	4	5
1. Performance (midpoint)					
2. Attributions	.20				
3. Affect	.40	.45			
4. Expectancies (ROE)	.04	.40	.34		
5. Effort	.07	.16	.25	.21	
6. Performance (final)	.49	.21	.42	.17	.31

N = 93

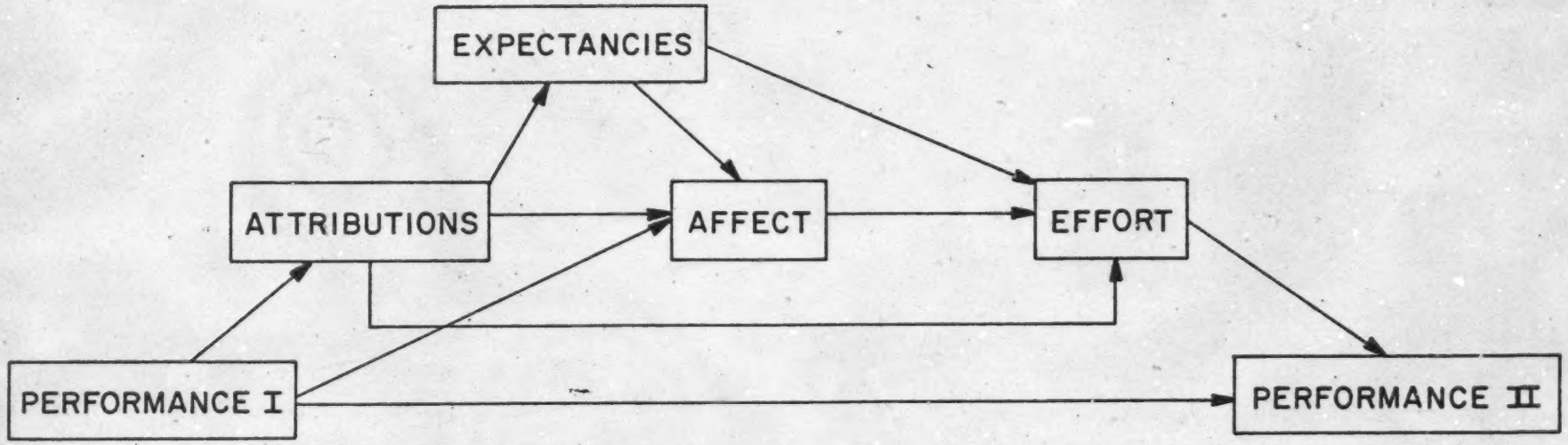
$p < .05$ if $|r| > .20$

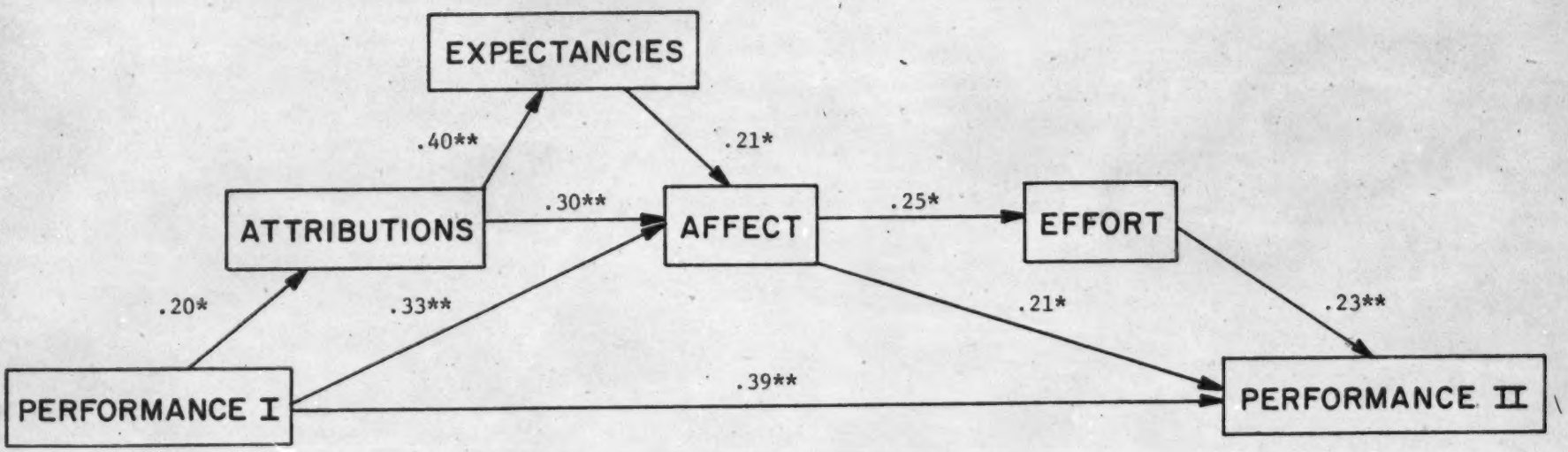
$p < .01$ if $|r| > .27$

Figure Captions

Figure 1. Predicted path model

Figure 2. Actual path model


EXPECTANCIES
ATTRIBUTIONS
AFFECT
EFFORT
PERFORMANCE I
PERFORMANCE II



All Numbers Are Path Coefficients

* $p < .05$

** $p < .01$